90a shifts so as to reach the position of the image 90b shown in FIG. 6B.

Explanations will now be made to operations of the image encoder 10 in the case where the input image 90b of FIG. 6B is continuously displayed.

In this case, likewise the case where the input image 90a is continuously displayed, the motion-vector-based block grouping section 22 does not arrange the blocks into groups. Instead, the DC-component-based block grouping section 26 arranges the blocks of the input image 90b into groups, based on values of DV components of the brightness and color information stored in the DC component memory 25. The weighting coefficient calculation circuit 27, to which the DC-component-based block grouping section 26 sends the grouping information (by DC component), assigns a largest weighting coefficient to each block corresponding to the portions of the man's image 92b which is positioned in the center of the input image 90b. Because the rest of portions, such as those corresponding to the woman's image 91b or background image 93b, are positioned away from the center of the input image 90b, the weighting coefficient calculation circuit 27 assigns a relatively small weighting coefficient to those blocks corresponding to the rest of portions. The quantization-step-width calculation circuit 28 assigns a small quantization step width to each block forming the man's image 92b and a large quantization step width to each block forming the woman's image 91b or background image 93b, based on the assigned weighting coefficient.

As a result of this, in the state where the view shown in FIG. 6B is continuously displayed for a predetermined period, the image encoder 10 encodes the portion corresponding to the centered man's image 92b in a high degree of preciseness, and encodes the portions corresponding to the rest of portions of the input image 90b in a lower degree of preciseness, and sends the encoded image data to the transmission path.

As explained above, in the first embodiment of the present invention, the quantization step width is set small for a person's image which may possibly be important in the input image, and is set large for the rest of portions of the input image which are

not so important. Having performed this, high quality image which is suitable for the TV conference system or TV telephone system can be transmitted. Further, even in the case where the input image has no motion, the display screen can be divide into several groups based on the color or brightness, and high quality image data showing the important image data of the main person can be transmitted.

In the first embodiment of the present invention, the weighting coefficient calculation circuit 27 uses the weighting coefficient assigned to each block according to the graphs of FIGS.2 and 3. For example, in the case where the contents of the input image do not change suddenly, the weighting coefficient assigned to each block of the input image changes slightly on the average, so the amount and the preciseness of the image data to be transmitted change slightly. Therefore, in the case where the contents of the input data do not change suddenly, the above weighting coefficient is preferable. On the other hand, for example, in the case where the contents of the input image change suddenly, the weighting coefficients change greatly, so the amount and the preciseness of the image data to be transmitted change greatly. Therefore, in the case where the contents of the input image change greatly, the weighting coefficient calculation circuit 27 may use normalized weighting coefficient, and supply the quantization step width calculation circuit 28 with the normalized weighting coefficients. The normalized weighting coefficient is the adjusted weighting coefficient so that the sum of the entire weighting coefficients assigned to the entire blocks of the input image frame is within a predetermined range of values. The normalization of the weighting coefficients makes the amount and the preciseness of image data to be transmitted stable.

Furthermore, in the first embodiment, weighting coefficients for the quatizaton step width may be used instead of the weighting coefficients representing the importance of each portion or each block of the input image. In this case, the weighting coefficient calculation circuit 27 calculates the weighting coefficient of each block for the quantization step width according to a graph which shows the more the number of the

blocks increases, the smaller the assigned coefficient becomes and a graph which shows the smaller weighting coefficient is given to the more centered positioned blocks, instead of the graphs shown in FIG. 2 and FIG. 3. Further, the quantization step width calculation circuit 28 calculates the quantizaion step width in accordance with the amount of data storage in the transmission buffer, using the functions f(x) shown in FIG.4, calculates a product of the quantization step width and the weighting coefficient of the block for the quantization step width, and sends the calculated product as a qunatization step width of the block to the quantization circuit 16.

FIG. 5 is a block diagram showing the structure of an image encoder according to the second embodiment of the present invention.

In the image encoder 50 according to the second embodiment, the same structural elements as those included in the image encoder 10 shown in FIG. 1 are identified in the same label in FIG. 5. As illustrated in FIG. 5, the image encoder 50 according to the second embodiment of the present invention further includes a weighting coefficient memory 69 and a weighting coefficient re-calculation circuit 70 in addition to the structure of the image encoder 10 shown in FIG. 1. In the structure of FIG. 1, the weighting coefficients calculated in the weighting coefficient calculation circuit 27 are sent to the quantization step width calculation circuit 28. In the structure of FIG. 5, weighting coefficients to be calculated in a weighting coefficient calculation circuit 67 are once stored in the weighting coefficient memory 69.

Stored in this weighting coefficient memory 69 are weighting coefficients calculated by the weighting coefficient calculation circuit 67 and assigned respectively to blocks of an K number of previous frames. The weighting coefficient re-calculation circuit 70 receives the weighting coefficients of the K number of previous frames from the weighting coefficient memory 69, calculates a new weighting coefficient based on Equation 1, as will be described below, and sends the calculated coefficient to the quantization step width calculation circuit 68.